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*(11) Oct,*

FURTHER IMPROVEMENTS IN  
THE TREATMENT

OF

MALIGNANT STRICTURE

OF

THE OESOPHAGUS.

BY

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## FURTHER IMPROVEMENTS IN THE TREATMENT OF MALIGNANT STRICTURE OF THE OESOPHAGUS.

THE short tube which I introduced for the treatment of this disease was shown in use for the first time at the Clinical Society in 1881. An account of the patient, with an illustration of the condition found after death, showing the tube *in situ* (Fig. 2), will be found in the Transactions (vol. xviii.). Since that time a paper was published, with four cases,<sup>1</sup> giving a further account of the tube, and detailing its advantages and the limits of its usefulness. As, however, no illustration accompanied that paper, and as I am frequently asked concerning the method, the present communication is a reply to this question. I was unaware at the time that I used this tube that Sir Morell Mackenzie had employed a very similar short tube for the purpose of dilating the stricture. A figure of this will be found in his work, which I had not read in 1883. Mackenzie's tube was, however, not designed for permanent use. I wish to take this opportunity of correcting the oversight.

Various improvements have been made in the construction of the tubes and in the method of introduction, and the extended opportunities of the past four years and a half have added an experience which, I think, will prove valu-

<sup>1</sup> Brit. Med. Jour., April, 1887.

able to others. A new feature in the treatment of the final stage of the disease has been introduced, by which, I think, it will be conceded that patients are made more comfortable than by gastrostomy. Life has been prolonged in all the cases, and in none has the tube caused any evident injury. The effect of this prolongation of life has been to allow more time for the spread of the growth, and so to introduce secondary complications of great severity; at least this seems to me one reason, if not the chief reason, why the patients have such severe pulmonary symptoms. In order to make this paper as complete as possible, I will describe first the short tube and its uses, and then the new one for use in the final stages of the malady.

**SHORT TUBE.**—This tube is from four to six inches long, and is made of gum elastic on a silk web. The upper end is expanded into a funnel; the lower is rounded and closed. The essentials of a good tube are: (*a*) The wall does not increase in thickness with the increase in the bore. A No. 14 English catheter gange will thus have a wide calibre. (*b*) The inside of the tube should be polished as well as the outside, to allow of the more easy passage of fluids. (*c*) The eye should be a quarter of an inch from the end, and of large size; and (*d*) beyond the eye the tube should be hollow to the end. (I mention this last point, since tubes have been made with a solid end—a disadvantage which I will presently point out.) A piece of plaited silk is passed through about three-eighths of an inch below the rim of the funnel in a single thread, and the portion inside the tube drawn out and tied to the side pieces about two inches above the funnel. (See Fig. 1.) This method of securing the silk seems better than two separate pieces, and never leads to blocking of the tube.<sup>2</sup>

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<sup>2</sup> The word "patent" was stamped on some of these tubes, and was done, Mr. Down tells me, by the manufacturers to protect a certain construction of the eye. This has been removed. The tubes, with all instruments described, are made by Messrs. Down of St. Thomas's-street, London-bridge, S.E. I specially mention the makers, since tubes of improper construction and badly threaded are often sold by others.

FIG. 1.

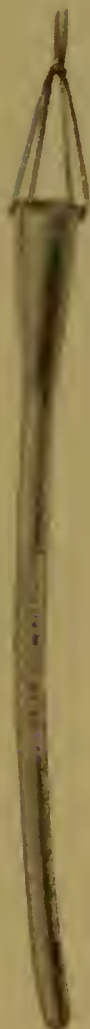
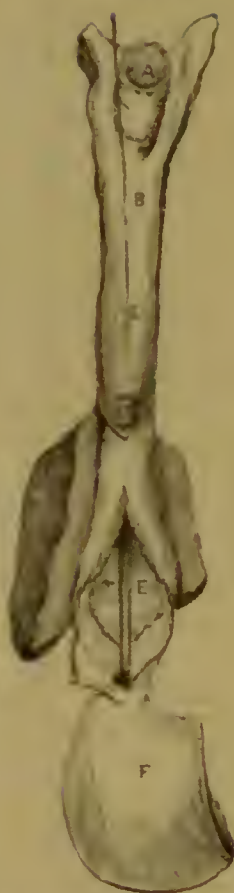


FIG. 2.

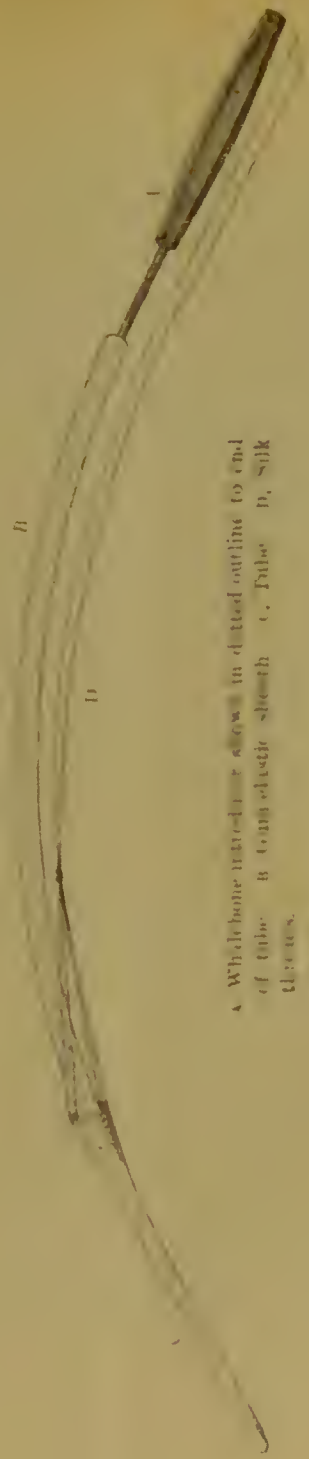


Esophagus laid open from behind. A, Laryngeal aperture. B, Esophagus. C, Silk. D, Funnel end of tube. E, Lower end of stricture. F, Stricture.

*Object.*—The object of the tube is to carry the fluids through the stricture, and thus to enable the patient to drink and so enjoy the taste of his food. This is accomplished by the position of the tube. It rests in the œsophagus, with the funnel upon the upper surface of the stricture. At times, therefore, the funnel will be from eleven to sixteen inches from the teeth. Fig. 2 shows the tube in position. (I have to thank the Clinical Society for permission to use this illustration.) How far this has answered will be seen presently. The length of the œsophagus involved in the disease varies from half an inch to six or seven inches. For this reason it is necessary to have a tube of average length, since it is not always possible to estimate the extent of the disease. Again, the gullet may be narrowed at two points, and thus in some cases a tube of a foot in length will be found necessary. I will explain presently how this may be made in an emergency for any case.

*The Introducer.*—As originally pointed out, the tube may be inserted by a bougie. The end of the bougie is placed in the funnel, and the tube (previously chilled in cold water to render it as hard as possible) is passed down. The difficulty in this method is that the tube is apt to coil up, and when it is thought to be through the stricture is in reality simply coiled up in the œsophagus above it. Still in some strictures, especially those at the lower end of the tube, no other method will succeed at first, owing to the tortuosity of the passage. The next plan is to use some form of introducer. The one originally suggested by Mr. Gowan was made of copper wire. I now prefer a piece of whalebone (Fig. 3) as being more supple. Outside the whalebone stem is a gum-elastic sheath. The whalebone fitted with this is passed down to the end of the tube, and the sheath fitted into the funnel. On inserting, pressure is made by the sheath, the whalebone keeping the tube rigid. By this means a tube with an open end can be used, and the danger of pushing the whalebone stem through

FIG. 3.



a. Whole bone introduced in a wax in dotted outline to end  
of tube. b. Complete sheath c. Tube d. Silk  
threads.

the end of a tube avoided. I usually employ the bare whalebone stem, as there is less bulk in the patient's throat. The advantage claimed for the wire, that by bending it backwards the tube could be directed along the pharynx, does not seem of so much importance as was first thought. Gentleness being as much essential to success here as in the urethra, it is not necessary always to use the gum-elastic sheath to press down the funnel, provided the end of the tube be sound and will bear a moderate amount of pressure. Such an addition can be made by anyone possessing a No. 12 catheter. The necessity of a hollow end is now seen, for when solid up to the eye the introducer is apt to slip out and injure the œsophagus when the sheath is not employed.

*The Introduction.*—First ascertain by a large bougie the exact position of the stricture—i.e., the number of inches from the teeth; then pass the largest conical bougie possible, and judge by this the size of the tube to be used. Fitting now the introducer, mark on it the distance to the stricture, or make a knot in the silk and insert with the head thrown well back. When it has entered the stricture, send the tube down slowly till arrested by the funnel, and withdraw the introducer. The silk being held taut, the tube is kept in contact with the introducer. When the stricture has become dilated, there is a danger of passing the funnel through altogether if it is a small tube. This will not occur, as a rule, with a No. 14, which is about as large a size as it is wise or necessary to use in malignant disease. Such an accident may be avoided by accurately measuring the position of the stricture on the introducer, and by passing the tube down five inches after reaching the stricture. One can, however, always feel when the funnel is entering the narrowed part. It is essential to *avoid hurry and force*, to withdraw at once if there be a spasm, and to keep in the *median line*. The silk is now tied round the ear, and fixed behind by a piece of strapping.

*Accidents.*—The silk may be bitten through and swallowed;



it then falls into the funnel and obstructs it. When this first happened to me, I pushed the tube through the stricture and inserted another. Dilatation having been effected, no difficulty was experienced and no inconvenience felt from the tube. In a recent case I managed to hook up the silk by a piece of copper wire. The hook in the wire was passed into a tube and then protruded. I have also had a pair of forceps made for the same purpose. As a rule, the tube may safely be pushed into the stomach. In one case related to me such a tube was passed in sixteen days. To prevent this accident, select the side where there are fewest teeth, and if none are wanting, the silk may be covered with a piece of small rubber tubing. The silk must, however, be watched. In a recent case it was quite sound after two months' continuous use. In some cases it will be justifiable to extract a tooth in the upper jaw.

*Duration.*—The longest time I have left a tube in without removal was two months. This patient, whose case is mentioned below, lived in Devon. When removed (No. 14), the tube was still pervious and useful. I, however, put in a new one, as she had so far to go.<sup>2</sup> A German writer upon these tubes, Dr. Renvers, has employed horn, since he found the tube cracked. I can only think that his material must be inferior to that with which mine are made, as I have never found such a result occur after an extended use of these tubes. While this is the form of tube most generally useful, several varieties have been constructed for me and for others. I have had some made with the lower end open to allow a freer flow of the fluids, but this shape has not in my experience possessed any advantages over the ordinary form, provided the eye is large and the other features as detailed above. If we can estimate the length of the stricture exactly, as is occasionally possible, then a tube an inch and a half long

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<sup>2</sup> I hear from Dr. Stediff of Torrington that he changed the tube after three months use.

with an open end would be the best form to employ. Such a modification has been employed by my colleague, Mr. Clement Lucas. Dr. Renvers<sup>4</sup> made trial of the tubes in Professor Leyden's wards in Berlin, and has used tubes of horn and hard rubber two inches in length with complete success. These materials, he states, did not give rise to any inconvenience from their inflexibility. Dr. Renvers had them made with the antero-posterior diameter of the funnel smaller than the lateral to facilitate removal. This is, I think, a distinct improvement, as occasionally there is difficulty in removing a tube, owing, in old people, to the projection of the cricoid, and I have adopted it. In the great majority of cases, however, the round funnel answers perfectly well.

*Treatment of Malignant Stricture.*—The mechanical treatment of this disease divides itself usually into two periods: first, that in which pure dysphagia exists; and, secondly, that in which swallowing is accompanied by spasmodic cough—a symptom indicating pulmonary complication. During the first and longer period four methods may be employed: (1) the passage of bougies twice a week; (2) the use of a long tube; (3) the use of a short tube; and (4) gastrostomy. So long as a patient can take solids even finely minced, the use of a bougie will for some time maintain the channel. When the swallowing of fluids becomes difficult, then at once a short tube should be inserted in preference to the long feeding tube. Unfortunately we frequently do not see cases till obstruction has become complete and the passage of a bougie impossible. Under these circumstances I have usually succeeded in the following way. The œsophagus is emptied by passing a bougie; then all fluids except sufficient to quench the thirst are withheld, and the patient supported by enemata containing opium. He is confined strictly to bed and kept warm. After two days a further attempt is made while he is

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<sup>4</sup> Zeitschrift f. Klinische Medicin, Bd. xiii., Heft 6.

under the moderate influence of morphia administered subcutaneously. Spasm is relieved, and, as a rule, a bougie can be passed. If possible, a short tube (No. 8 or 10) is inserted, but if the passage is too tortuous to admit of this, then a long feeding tube (No. 20) is passed, and retained for a week if possible. This will straighten the passage and enable a short tube to be introduced. As a rule, the patient can then be conducted safely and comfortably to the period when cough ceases on deglutition, and, if this complication does not occur, till the close of life. The tubes should be inserted in the intervals of a week or ten days, until No. 14 is reached, and then retained as long as possible. In one case it lasted well for three months. The cases here summarized give details of treatment, and show the grounds for preferring this method to any other. In a few cases, no doubt, the stricture cannot be traversed by any means at our command. I have met with this difficulty in one case only. Here the disease was at the beginning of the gullet, and had destroyed the entire wall for three inches, so that on entering the cavity it was impossible to hit the distal end. This man, however, was able to take plenty of nourishment, and therefore did not require gastrostomy. As to gastrostomy, I hold, as a result of my experience, now fairly extensive, that it is unnecessary in the early stages, tubage being preferable and giving far more comfort. There may, however, be a case now and then in which tubage fails from the first, and in which gastrostomy is the only remedy.

*Second stage.*—When deglutition causes pulmonary irritation and cough (a very frequent complication) on account of perforation into the trachea, bronchus, lung, or pleura, then all fluids must be removed from the esophagus. There are two methods of accomplishing this. One by the use of the long tube of Krichaber, or some modification of it, and the other by gastrostomy. Dealing first with the latter method, I would remark that this stage is most unfavourable for recovery: the patient is much reduced, and too often

sinks under the operation, even though feeding be commenced at once. This applies with greater force to those cases which have not been obtaining nourishment by tubage previously. A very slight shock is sufficient to overturn the balance and terminate the life. Even too energetic and prolonged attempts at tubage in such cases are unwise. Better to give enemata, enjoin rest, and keep the patient warm for a few days before repeating attempts at tubage or undertaking any operation. I do not at all wish to appear to hold that gastrostomy is an unsafe procedure. Mr. Howse has placed this operation on a sound and successful basis so far as *method* is concerned; but all these precautions have not added much to the success in malignant cases, so far as life is concerned; the majority succumb.

Next we come to the use of the long feeding tube permanently retained. I mentioned in the paper referred to in the *British Medical Journal* that I had found the hard tube used by Krishaber and others cause ulceration of the mucous membrane over the back of the cricoid. I have since found the same effect. I also gave my adhesion to the use of rubber tubing, as suggested by Mr. Berry.<sup>5</sup> In one case I tried his method of introduction, and succeeded after great trouble. I think the plan suggested below will be found more easy of application.

**NEW LONG TUBE.**—After many suggestions and experiments I had made a rubber tube of the same pattern as the thick-walled stomach tube used for feeding only, and not for retaining. This has a closed catheter end and a large eye. It was passed in one case by the whale-bone introducer and succeeded perfectly. A simple device then occurred to me, by which anyone can make a tube in a few minutes. Take a piece of red rubber drainage tube with a thin wall and a wide bore, and about eighteen inches long; cut one end obliquely and sew it up, thus obtaining

<sup>5</sup> St. Bartholomew's Hospital Reports

a conical end; next cut a large eye in the tube about an inch from the extremity; or two openings may be made. To prevent the introducer catching in the point, fill up the interior where stitched with a plug of cotton wool. Oil the interior of the tube and introducer thoroughly. Glycerine is usually employed. Insert this with the whalebone introducer. Once more it is essential that the wall of the tube be thin, otherwise it may irritate. The outside diameter of the tube need not be more than that of a No. 12 catheter. That such a tube can be borne over the larynx and in the mouth was established by Mr. Berry. My own experience is limited to two cases. In one it was worn with complete comfort for four months and a half. It was once coughed out after a month's residence; a new one was inserted and never removed. Though towards the close of life the man had severe pulmonary complications, with cough and expectoration, the tube was not ejected, nor did it ever give rise to irritation. This, then, overcomes a difficulty with which I have been contending for two years or more. It will enable us to feed our patients without performing gastrostomy. This man fed himself and increased his weight considerably. It is the exception for patients to be spared this troublesome cough on deglutition. If it does not occur, the short tube may be worn till the close of life.

*Objections to tubing.* The only objection I have met is the ulceration of the pharyngeal mucous membrane over the cricoid. This occurred after the use of the long black hard tube, and will take place in two days. The glazed surface is fretted off the tube in that time. Whenever a patient complains of pain in swallowing, and has cough and irritation, when such did not exist prior to the use of the tubes, he will most probably be suffering from this complication. The nasal route used by Krishaber may avoid this, but I think the rubber tube will be the best of all methods. It was thought, when first introduced, that the funnel of the short tube would produce ulceration. In twenty-two cases



in which I have now used it the patients never complained of pain. None of them felt the tube, even to No. 16. Of these, I have inspected the œsophagus after death in six, without finding the least evidence of irritation. The observation I have made, that complications are more severe under tubage, seems, as I have said, due to the prolongation of life and the time given for extension of the disease—a proof, if true, that life is prolonged. Once more: Tubage, it was thought, would hasten growth. The previous point, if true, is opposed to this; so I think is another point—viz., that the short tube, by carrying food through the stricture, prevents its decomposition in the œsophagus. The foul material ejected on passing a bougie must have a prejudicial effect on an already ulcerated surface. Tubage may be commenced in any stage of the disease; the existence of ulceration does not contra-indicate the method.

*Special causes of difficulty.*—The main difficulty in tubage arises from the situation of the disease. The most difficult cases are those in which the lower end is affected. The longest distance from the teeth I have encountered is seventeen inches, others sixteen, fifteen and a half, and fourteen and a half inches. At the lower end, due probably to the effect of the diaphragm, the channel is apt to be tortuous; and, again, on account of the same cause, the spasmodic contraction of the muscle probably closes or modifies the channel. In one case the channel turned abruptly to the right, and then, after a short horizontal course, downwards into the stomach. After passing a tube in one of these cases, and pouring in some milk, such intense pain followed that I feared I had perforated the peritonæum. The man was cold, blue, and almost pulseless, from starvation pure and simple. I withdrew the tube, and after death found that no injury had been inflicted. The pain was due, I imagine, to the entry of cold milk into a stomach long deprived of food. Next time I shall use warm fluid, and very little of it.

These difficult cases will be best overcome by passing a short tube on a bougie, so as to retain its flexibility. Another difficulty arises from the extent involved. If from six to eight inches be diseased, a short tube must be from ten to twelve inches long to be effective. I used such a one with complete success in a very bad case (Mr. F —). A tube can in such emergency be constructed thus: Cut off the funnel of a tube and draw over it a piece of rubber tube of the required length; prepare the end as described for the long rubber tube, and insert. Again, much difficulty is encountered when the disease is at the level of the cricoid.

The following cases are given for the purpose of further illustrating the use of the method of tubeage.

CASE 1. *Malignant stricture, tubeage two and a half months.*—Mr. F —, aged fifty years, was brought to me by Dr. Mariauke Hart on January 10th, 1888. He had had dysphagia nine months. He had been restricted to fluids for one month, and for a week had hardly swallowed anything. He had lost 14 lb. in weight. His pulse was 100, irregular, so weak, and so cold, and had such a feeble pulse, that I was obliged to place him before the fire and get him warm before attempting treatment. He had seen several of the leading consultants in London. The stricture was found eleven inches and a half from the teeth. A No. 10 short tube was passed, and he at once took milk and brandy, though with still some difficulty. There was a foul odour on the bougie, and some bleeding. In any case, after nine months the remaining duration must have been short; the evidence of ulceration strengthened this view. He returned in a fortnight, looking a very different man. His pulse was strong, his colour had improved, and he had gained flesh. No. 12 was passed. Ten days later he returned with the tube blocked, and on removing it I found a hard piece of meat in the funnel. No. 16 was passed easily. The tube when removed was extremely foul. On February 22nd (i.e., eighteen days after insertion) the tube became blocked, and on withdrawal a piece of growth was found in the funnel.

On microscopic examination it showed carcinoma. The patient had been able to go out and attend to his business at times. At his request I left the tube out, but he was unable to swallow, and after two days a fresh one was inserted, but he was unable to swallow next day. I then visited him, and found that he had never swallowed so freely as he ought to have done. I then inserted a long rubber tube, specially made and described above. This answered admirably, and was worn ten days. He, however, although now getting weaker and suffering from pulmonary complications, begged for a short tube. In thinking over the case, it seemed clear that the growth was a fungating one, that the passage was wide and obstructed by masses of growth, and that the reason why the former tube did not act was either that the funnel passed too far, or that, a lengthy part of the gullet being involved, the end did not reach beyond the disease. To meet these difficulties I made a tube out of a piece of large rubber drainage-tube, drawing it over the funnel cut off an ordinary tube. The end of the rubber was cut obliquely and sewn up to make a conical end; two large openings were made, one near the point, and one two inches up. It was about one foot in length. It was passed easily on the whalebone guide, and at once he swallowed with the greatest ease, and continued to do so until his death on April 1st, three weeks and a half after its insertion. I have referred to the method of manufacturing this tube above. The total duration of the case was one year; before treatment, nine months and ten days; after treatment, two months and twenty days. This man was so ill that I believe he would have succumbed to any operation. The account shows that severe ulceration and sloughing of the growth existed before tubage was commenced.

CASE 2. *Malignant stricture; tubage two months.*—E. B.—, aged fifty-three. This poor fellow I saw with Dr. Angus Hunt of South Hornsey. He was emaciated to the most extreme degree I have ever seen. He spent his time in bed, alternately taking and rejecting fluids. Yet



withal he managed to preserve an amount of good humour and fun which was quite surprising. Dr. Hunt had detected a stricture fourteen inches and a half from the teeth. The man said he had been ill one year, and had had dysphagia six months. On March 1st, 1888, a short tube could not be introduced, owing probably to the tortuosity of the stricture. A long silk-web feeding tube was inserted, with a view of dilating and straightening the passage. Through this abundance of fluid nourishment was given. On the 13th, a No. 10 short tube was passed easily and he swallowed half a pint of milk at once. A week later the tube became blocked, and was removed, the long one being reintroduced to prevent closure. Two days later Dr. Hunt passed the short tube, and a week later (March 27th) inserted a No. 13. The man now began to have symptoms of pulmonary affection, and died of gangrene of the lung on April 28th. Dr. Hunt, to whom I am indebted for these notes, says: "The patient improved markedly up to the end of March, put on flesh, swallowed all sort of strained fluids freely, and moved about briskly; from that time he began to go downhill, refused the beef-tea because of the nasty taste it had, and took gradually less, but he swallowed without apparent difficulty up to the last, and died from gangrene of the lungs and exhaustion, *not* from starvation." This man's improvement was like a resurrection. He was dying of starvation, and would probably have done so before pulmonary complications set in; these, on reading the case, seem to have been precipitated by treatment: they may have been, but the evidence in other cases is against it. Total duration of case, eight months or more; before treatment, six months; after, two months; duration after lung complication, one month.

CASE 3. *Malignant stricture of oesophagus twelve inches and a half from teeth; intubation for two months and a half; death from exhaustion and pulmonary complications.*—James E.—, aged fifty four. Dysphagia for solids began eight weeks before admission to hospital. For six weeks he

had been restricted to fluids. On admission, on Aug. 16th, 1886, he was only able to swallow small quantities, and these very slowly. On Aug. 21st a No. 10 bougie was passed. The stricture was situated twelve inches and a half from the teeth. On the 23rd a No. 16 was passed. On the 31st a short tube was introduced and retained; on Sept. 7th it was removed. He could not swallow without it, so a No. 12 was inserted. He was discharged on the 8th, wearing a tube. On Sept. 15th he came to the hospital, and the tube was removed. As he could swallow fairly without it, the tube was not again inserted. The next day he returned, unable to swallow; a No. 10 was therefore passed, and he went home. On the 23rd the old tube was removed, and a No. 12 inserted. On Oct. 1st a No. 16 was introduced. On the 9th he was admitted into Philip ward, and on the 12th the tube was changed. On Oct. 9th he was discharged, wearing a tube. The man died on Nov. 9th. His son, in writing to me, said that his father had been able to swallow well up to the time of his death, the tube remaining in position. He suffered from a severe cough for a week before his death. Total duration of case, five months; before treatment, two months and a half; tubage, two months and a half.

CASE 4. *Malignant stricture of œsophagus; treatment by bougies and tubage.*—Fred. C—, aged forty, came to Guy's Hospital on October 7th, 1886. Dysphagia for six months. Stricture ten inches from teeth. He stated that his mother had died from "cancer in the throat." A bougie was passed, and the next week he was much better. Up to March 10th, 1888, he was treated as an out-patient by bougies twice a week. He could take solids on most days, and continued his work. A cough commenced in December, 1887, and his voice became then high pitched. He was admitted for better observation. On March 28th it was noticed that fluids made him cough, but that he could take solids or thickened fluids. He was discharged on April 11th, but returned on the 30th, unable to swallow.

The œsophagus was dilated with bougies, and on June 9th he was again discharged. He was readmitted on June 23rd, because the cough on swallowing fluids continued. A short tube was passed, by which he was able to swallow without cough, and from this date till his death on July 25th he continued to swallow well. My dresser, Mr. Hooking, took charge of this case during my absence. In less than a fortnight the patient gained nearly a stone in weight (12½ lb.). He died suddenly from hæmorrhage—due, no doubt, to ulceration of the aorta. Total duration of disease, fifteen months; treatment, nine months; by bougies, eight months; by tubage, one month.

CASE 5. *Malignant stricture: tubage: death from pulmonary hæmorrhage.* David A—, æt. fifty-two, a tall extremely emaciated man, came to Guy's Hospital in June, 1887, with dysphagia of nine months' duration, and had been restricted to fluids for three weeks. A bougie detected a stricture eleven inches from the teeth, and one was passed through. As there existed entire obstruction, he was admitted under Dr. Goodhart on June 27th, who has allowed me to make use of the notes. On June 30th a short tube could not be inserted, though the man could swallow fairly well. On Aug. 14th a tube was inserted. From this date till Sept. 16th a tube was worn more or less constantly, but became blocked more frequently than usual, a result that could only be attributed, as the necropsy proved, to injudicious feeding. He was now able to take bread-and-butter and rice pudding, and had gained in weight 6 lb. Before he left, on Sept. 23rd, a tube was inserted. On Oct. 10th he was readmitted with great pulmonary distress, and was reported to have had a cough for some days. The tube had been acting well. He died next day, and the cause of death was due to phthisis, old at apices, with recent tubercle throughout the lungs. There was no complication secondary to the epithelioma, which was situated opposite the tracheal bifurcation, and was of the local circular and cicatrising form. It involved all the coat, and had just begun to invade the aorta.

There were a few enlarged glands, but no secondary deposits. No explanation could be found at the necropsy for the difficulty experienced in inserting a tube. Duration of case, thirteen months; before treatment, nine; after treatment, four. This case was cut short by pulmonary tubercle, otherwise he might have lived some weeks. He would have died in all probability from perforation of the aorta.

CASE 6. *Malignant stricture; tubage six months.*—Mr. T——, aged seventy-two, was seen in consultation with Mr. Button, of Bermondsey, on Oct. 7th, 1887. For three months he had dysphagia, and for the last two months was restricted to fluids. A stricture was found fourteen inches from the teeth; it admitted a small conical bougie. He had once (two days before being seen) had complete obstruction. On account of his age, absence of cough, and absence of foul odour on the bougie, a prognosis of six months was given. On Oct. 15th a No. 7 short tube was inserted. He wore this, with changes, for six weeks and a half, when cough on swallowing ensued. Then a long hard tube was inserted, which after two days was removed and a rubber one employed. This he wore for the remaining four months and a half of his life without any irritation, and completely relieved of his cough, until pulmonary gangrene ensued, of which he died just six months (April 15th) from the first time I saw him. Under tube he increased in weight—became, in fact, actually stout,—took long walks, and attended to his business. In February there was a good deal of bleeding. Pain in the chest began about five weeks before death, up to which time he was perfectly comfortable. Total duration of case, nine months; before treatment, three months; after treatment, six months; duration after cough in swallowing commenced, four months and a half; duration after onset of severe lung complication, five weeks.

CASE 7. *Malignant stricture; successful tubage; rapid improvement; sudden death.*—John O——, aged sixty, sent by Mr. Cooper, of Bermondsey, on July 9th, 1888. Dysphagia four months; restricted to fluids two months. A stricture

was discovered thirteen inches and a half from the teeth, but the man was so emaciated, cold, and had so feeble and intermittent a pulse, that he was admitted (though his friends were opposed), put to bed, surrounded by hot water bottles, and fed by enemata. In forty-eight hours he had so much improved that he was now fit for tubage. On July 12th a No. 9 short tube was inserted, through which he swallowed freely. Enemata were omitted. On the 15th he was given five pints of milk and beef tea, three eggs, and brandy daily, and looked much better. On the 17th a No. 14 was inserted. On the 20th he got up, and on Aug. 3rd he went out. The record of his weight is most surprising. On July 12th a No. 9 tube was inserted, and on the 15th his weight was 7 st. 1 lb.; on the 17th a No. 14 was introduced, and on the 25th his weight had increased to 8 st. 6 lb., a gain of 19 lb. in ten days. The man looked also as if he had gained this amount. He was almost dead on admission, but preserved fortunately sufficient strength as to desire to be relieved. When discharged on Aug. 3rd, he weighed 8 st. 11 lb., a total gain of 1 st. 7 lb. in nineteen days. On Aug. 10th he came to the hospital and was weighed, the record being 8 st. 12 lb., and he was swallowing freely. A few days later we heard of his sudden death. No particulars came to hand, but no doubt it was due to ulceration into the aorta. Total duration of case, five months; before treatment, four months; after treatment, one month.

CASE 8. *Malignant structure of œsophagus seven inches from the teeth; intubation for eleven months.*—Phyllis D—, aged thirty nine, while eating her dinner one day at the end of the summer of 1887 (say the end of August), suddenly found herself unable to swallow solids. On March 9th, 1888, she came as an out patient with dysphagia, which had existed for six months for solids, and swallowed fluids with difficulty. A conical bougie was passed. The next week she complained that she had had much pain after the passage of the bougie, but declined further treatment.



As, however, she could not swallow at all, she was guided by advice and entered the hospital on March 19th. On admission she was pale, but not thin. She referred her difficulty to the level of the cricoid. A bougie was arrested seventeen inches from the teeth, and admitted about a No. 13. On the 21st a No. 8 short tube was inserted without any difficulty, and from the duration of the case, the ease with which the stricture was traversed, and the absence of blood or foul odour, the disease was thought to involve a small part of the length of the tube, and to be of the contracting form, and that therefore the prognosis was good. The silk for three days produced a little itching. She took eggs and milk. On the 27th a No. 11 was introduced. On April 2nd a No. 14 was inserted, and she went out and returned to her home in Devon. On May 29th she came to the hospital looking much improved. The tube, which had been in nearly two months, was removed, and, though found softened at its lower end, was still useful; the silk was uninjured. After trying for a day unsuccessfully to swallow without the tube, a new No. 14 was inserted, and she returned to Devon, where she passed under the care of Dr. Sutcliffe, of Great Torrington, to whom I am indebted for the further notes of the case. In July she had cough and expectoration, and severe complications threatened to arise. On Aug. 19th Dr. Sutcliffe wrote to say he had removed the tube, which had been retained nearly three months, and without difficulty he had inserted another, giving great comfort to the patient. On Sept. 19th he again wrote to say that the patient had been able to go on a visit to a relative, and that though she had had a severe cough it did not interfere with the action of the tube. On Jan. 4th, 1889, Dr. Sutcliffe wrote that for a month she had had a good deal of cough, and had emaciated. On Jan. 3rd the tube which had been worn for two months was blocked, and was replaced by a new one. Very little benefit was afforded probably owing to some alteration in the form of growth, or to extension to the lung. Accordingly Dr. Sutcliffe passed

a long rubber tube such as I have described in this paper, through which the patient was fed. He, moreover, said that she never had any *difficulty* in swallowing up to Jan. 3rd. "The tubes," he added, "had certainly given her eight or nine months of life in a state of comparative comfort, which was more than could have been expected in a case hopeless from the first." On Feb. 1st the patient died. She wore the long tube for two or three weeks, but suffered much from sickness, due partly to the tube. After its removal, which became necessary before death, she was still sick on the slightest movement, and had to be fed by *gavage*. Dr. Satchell, in writing of the case, says: "There is no doubt your tubes prolonged her life some eleven months, nine of which were passed in very tolerable comfort, and I think her death was caused more by the constitutional effect of the growth than by the want of nourishment; in fact, she was kept alive as far as in the nature of the case was possible." Total duration of case, eighteen months; before tube, seven months; after tube, eleven months.

CASE 9. *Obstructed oesophagus, removed by the tube.*—Mr. C—, aged forty three, was sent by Mr. Edgar Duke, of St. Leonards, on May 10th, 1888. He had dysphagia for solids since November, 1887 (six months), and was restricted to fluids for six weeks. He had total obstruction a week previously to being seen, and again a few days afterwards. On May 10th a bougie was passed, detecting a stricture eleven inches from the teeth. He was an unhealthy looking man, but had no other complaint. He was unable to swallow even fluids. On the 12th a No. 10 short tube was inserted, through which he swallowed freely. Four days later he came with the tube blocked, and, on removing it, a piece of almond was found obstructing the funnel. On the 24th a No. 14 was inserted, and he returned to St. Leonards. On June 23rd he again came to the hospital, looking much better. The tube was acting well. He complained of pain in the chest. On July 19th

the tube was still acting. He had no cough, but had lost flesh. On Aug. 11th the silk gave way, the tube having been retained seven days. The man's teeth were unsuitable for the silk, which ought to have been protected and more carefully watched. Next day he could not swallow. On the 13th he vomited blood, and then was able to swallow. On the 14th he saw Mr. Williams, our house surgeon, who, as one of my dressers, had some experience of tubage, and in whose care I left the patient on leaving for my holiday. Mr. Williams, on Aug. 18th, seven days after the breaking of the silk, pushed the old tube easily into the stomach, and inserted a new one. I saw the man on Aug. 21st; he was swallowing well, but his breath was becoming foul. On Sept. 30th I saw him at St. Leonards. The tube was free. He was expectorating blood somewhat altered. As he was anxious to try to swallow without the tube, it was removed. The bleeding continued during the day, and dysphagia became complete. The tube was again inserted, but soon complete obstruction occurred, and, on removing the tube next day, it was found plugged by a coagulum. It was reintroduced. On Oct. 1st Mr. Duke again removed the tube, and fed him by a long tube. Then after ten hours rest the bleeding ceased, the short tube was replaced, and through this he continued to swallow freely till his death on Dec. 8th. Total duration of disease, thirteen months; before treatment, six months; after treatment, seven months. This patient was completely relieved from the first moment, and, as he never had cough or deglutition, he retained the tube till his death, which occurred from exhaustion. There was, says Mr. Duke, evidence of pressure on the left bronchus, for the lung on this side became almost airless, although there was no consolidation or dullness. This did not occasion any distress, though there was some cough.

CASE 10. *Malignant stricture: five months' tubage.*—Wm. D — — was sent by Mr. Lipscombe of St. Albans in May, 1888. He had had dysphagia since October, 1887



i.e., seven months,—and had been taking fluids only, and these with difficulty, for more than a month. On passing a bougie the stricture was found fourteen inches from the teeth. A quantity of foul fluid was rejected from the œsophagus. On May 10th a No. 12 was at once inserted, and through this the man drank half a pint of milk, and immediately afterwards a whole pint in two draughts, much to his delight, as he had not done such a thing for three months. He returned in a week, when a No. 14 tube was inserted. This he wore, with occasional removals by Mr. Lipscombe, till Aug. 16th, about three months. On Aug. 23rd he was admitted with cough and purulent expectoration, but able to take solids and fluids. He improved a good deal, and his cough was easier. He had, no doubt, suppuration of the growth and of the lung, though there were few physical signs. On Sept. 13th a No. 12 was inserted, and he went out. This tube he wore a fortnight. After its removal he was able to swallow solids at times. He, however, rapidly began to grow worse, and, with intermission of dysphagia, died in November. Total duration of case thirteen months; before treatment seven months; after treatment six months. The later days of this patient would have been made easier by the long rubber tube, but towards the end he swallowed sufficiently well to be satisfied.

CASE 11. *Malignant stricture of œsophagus at lower end.*—Thomas P—, aged seventy, sent by Mr. De'ath on Feb. 10th, 1888. Dysphagia began six months previously. He had taken no solids for three months. On admission he was a thin wasted man. He took fluids with difficulty, and was fed by enemata. On Feb. 12th a stricture was found sixteen inches and a half from the teeth. A small red bougie was passed. A tube could not be introduced. On the 16th a small bougie was again passed, also a No. 7 short tube, and he took a pint of milk easily. On the 18th the tube became blocked. It was removed, and a larger bougie passed, and then a No. 9 was inserted

easily. He could drink half a pint of milk at a draught. On the 24th the tube was found to be blocked. We failed to insert a No. 14, and a No. 9 was replaced. On the 29th the patient was able to swallow well, and looked much better. On March 6th the tube, on removal, was found to be bent in two places. It had therefore lain just above the stricture, and, as he swallowed well, must by its folding have produced dilatation. Only a small bougie could be passed. On the 13th a bougie was again passed. The patient was taking plenty of fluid nourishment without the tube. On the 15th the man went home. He came to the hospital once a week. Bougies were passed, and he was able to take solids again. A No. 18 bougie was passed easily at one time. The patient was lost sight of, and his death was reported soon after the last note.

CASE 12. *Malignant stricture at cricoid level; intubation.*—J. A—, aged fifty-nine, sent into Guy's by Dr. Day, of Edmonton, on Jan. 4th, 1889. On Sept. 30th, 1888, at 10 A.M., he sat down in a field to take his lunch, when he found himself unable to swallow solids. Since that moment dysphagia had increased, and he had not swallowed solids since Oct. 1st, or practically since the onset. He had worked till eight weeks previously. He was very feeble and cold on admission, so was put on enemata for two days. On Jan. 6th a stricture was found at the cricoid, seven inches and a half from the teeth. A No. 9 short tube was inserted, and at once he took milk food, much to his delight. Next day the tube was plugged by a coagulum of milk. On the 8th a No. 12 was passed, and on the 12th this was removed because he complained of pain. As dysphagia became severe, it was reinserted on the 15th, and remained in until his death on Feb. 4th. He had pain in his neck and up to his ears some days before he died. Total duration of case, four months; before treatment, three months; after treatment, one month. The pain which the man suffered was amply accounted for by the suppuration around the growth. There was no peculiarity of the voice in this case. At the

necropsy an epithelioma was found, reaching from the cricoid downwards for three inches and a half. It extended upwards over half the cricoid. The tracheal rings were involved and exposed, and at one point the trachea was opened, and there was secondary growth in the glands at several points. Suppuration existed in the surrounding structures. Death was due to broncho pneumonia.

The short tube I have now used in twenty two cases; of these, seventeen have died under observation, five of which have been already published, while notes of the remaining twelve are given above. Two cases were submitted to treatment for a short time only, and left the hospital relieved, but without tubes, and three are at present under treatment. Of the fatal cases, nine died with the tube in position, swallowing to the last; four were able to swallow without a tube for some time before death: in one a long rubber tube was substituted and worn in comfort for four months and a half. In one other (Case 8) a long rubber tube was used for three weeks after eleven months of the short tube. In two the long tube of Krisnaber was used after cough on deglutition ensued, and gave rise to much distress from ulcerations of the mucous membrane over the cricoid. The majority, therefore, wore the short tube up to the time of death, or were able to swallow owing to the dilatation effected. It will be seen that the patients lived variable times after treatment began, depending upon the duration beforehand and on the form of the disease. The longest periods were six, seven, eight, and eleven months. If it be granted, from the evidence of the results of post-mortem examinations and of the patient's sensations, that this form of tubage does not hasten the growth of the disease, then it seems quite clear that patients are more comfortable than after gastrostomy; they die from the unimpeded and unhastened progress of the disease. The majority of cases of gastrostomy succumb, probably not more than one in five recovering. Only once has an accident occurred to me or to my dressers in an experience

now of twenty-two cases, and this was not due to any injury inflicted on the stricture, but to a perforation of the pharynx high up. Besides these twenty-two cases, all under prolonged treatment and under various hands, we have treated quite ten other cases by bougies without accident. It may be said, therefore, that there is no danger in passing bougies; a great deal too much stress has been laid upon this point of danger. I have passed tubes and bougies in all conditions, and so have my dressers, without, so far, any accident save the one mentioned, and that occurred to myself, and might have been avoided, and now, with the new introducer, certainly will be in future. The improvement in the patients is remarkable: one man, as stated, gained 19 lb. in ten days, but he was nearly dead before treatment; while others have gained flesh less markedly, all have been benefited. The delight of a man at being able to swallow again is well worth seeing. It seems almost a miracle to him. We last saw under treatment a postman who came unable to swallow. He was admitted for one night and treated as described above. A No. 7 was passed, and he returned to his duties daily. During Christmas week he was swallowing freely, as a larger tube had been passed. From a perusal of the cases it will be seen that all were able to move about, and some to follow their usual occupation; when this is not laborious it may be carried on till the strength be reduced by the progress of the disease.

*Diagnosis.*—This disease is so frequently overlooked and so often mistaken for disease of the stomach, on account of the vomiting, that it may be well to add that, in a man over thirty-nine, dysphagia without symptoms of intra-thoracic pressure, accompanied by the rejection of food soon after swallowing, attended with wasting and in some cases the constant expectoration of saliva, is almost sure to be due to a malignant growth in the œsophagus. When blood and a foul odour are found on the bougie, the case is rapid and ulcerating. Auscultation is interesting, but the rushing sound is often absent.

In conclusion, I would claim for this method of treatment—that it is applicable to nearly every case of malignant stricture, and probably to all if seen early enough; that it affords the patient far more comfort than the long feeding tube; that it is superior to gastrostomy in the comfort it secures and in the freedom from danger; that life is prolonged in every case, and as long as after the most successful gastrostomy; that the tube does not give rise to any irritation, being tolerated by the most irritable patient; that, instead of favouring growth, it checks it, by allowing unhealthy fluids to pass from the œsophagus into the stomach; that the use of the short tube—and, when cough on deglutition arises, of the soft rubber tube—will enable us to treat all cases without resorting to gastrostomy.

*Note.*—Since writing the above, I have had the pleasure, while on a visit to Berlin in February of the present year, of seeing the tubes used by Dr. Renvers in Prof. Leyden's wards. Dr. Renvers tells me he has now employed the method in seventeen cases, and retained a hard rubber tube for six months in one instance. These hard tubes are one inch and a half long and open at the lower end, and are suitable for short hard strictures. I have not myself employed this form, being satisfied with the tube I have described here. Moreover, the plan originally suggested possesses the great advantage of simplicity, for an introducer can be constructed by anyone out of a piece of wire and a No. 12 catheter. In a subsequent paper I hope to give a description of the modifications after I have made a trial of them. Dr. Renvers showed me a patient suffering from a cicatricial stricture caused by swallowing a corrosive, whom he has successfully tubed. This is the first case, so far as I know, that has been treated by a short tube. While I was attending Professor Krause's clinic, a patient came with malignant stricture of the œsophagus, and was at once relieved by a short tube, which was inserted by Professor Krause himself. As to the general applicability of the method, there may be some difference



of opinion. Dr. Renvers is, he tells me, disposed to assert that tubes cannot be used by everyone, and that the introduction should be reserved for those practised in the use of œsophageal instruments. I trust, however, that the record of the above cases will show that it is a method capable of being used by anyone, and requires, as a rule, no more skill than does the passage of a bougie, but in many instances all the care and delicacy necessary to successfully traverse a urethral stricture. As I have said, not only have several medical men successfully conducted the treatment, but my dressers have also taken charge of cases for me for long periods. Some of my colleagues at Guy's have also taken up this method of treatment.

Weymouth-street, W.



